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Agricultural Business Profile on Swine Breeding Stock

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This profile has been compiled as a source of information for those in Prince Edward Island who may be considering the production of minimal disease swine breeding stock as a multiplier breeder, either in new facilities or in a depopulation/repopulation situation. It is assumed that the reader is already knowledgeable about commercial swine production. The reader is cautioned that the information provided should be considered as only a starting point. It is not a substitute for a business plan; a business plan incorporates specific information unique to the investor. The preparation and evaluation of a business plan is a critical step that must be taken before any significant investment is made.

While every effort has been made to ensure the accuracy of the information provided, the reader is further cautioned that information critical to his or her business plan should be verified. Particular attention should be paid to information that may become dated or that interprets legislation. In the matter of legislation, the specific Act and Regulations shall always have precedence over what is written or implied in this profile.

Abstract

The high health status of minimal disease swine in the Province and the excellent genetics and conformation that have been developed have created demand, both locally and abroad, for swine breeding stock from Prince Edward Island. A commitment to maintain and capitalize on this enviable health status has been made by the hog producers of Prince Edward Island, through their Hog Board, the Prince Edward Island Department of Agriculture and Forestry, and the Atlantic Veterinary College at the University of Prince Edward Island. Supplying greater numbers of certified minimal disease gilts will enable Prince Edward Island to compete for the larger orders being placed from commercial producers in North America and beyond. There is a market opportunity for those who can make the investment, diligently follow the production protocol, and accept the risks. Greater profits could accrue to those with superior business management skills.

Background

The marketing of swine genetics has been revolutionized over the last fifteen years. In the past, an individual farm sold purebred or crossbred gilts and boars resulting from years of matings and selection from within that particular herd, to whoever wanted them. The market was usually local, sometimes regional, rarely national, almost never international. Promotion was primarily by word-of-mouth and advertising in breed publications.

As commercial swine herds around the world have become larger and larger, requiring greater numbers of gilts per order, and as buyers have begun demanding greater uniformity and quality assurances in the stock they are purchasing, improved means of serving this market have emerged.

What has evolved is a "systems" or pyramid approach to breeding stock production, similar to how the

poultry industry has supplied breeding stock for many years. Swine genetics have now become a "property", characterized by closed herds with boar stations for the collection of semen, and controlled by a limited number of companies. Swine breeding stock producers have contracts or form alliances with a breeding organization or company, agreeing to a certain protocol in the production and marketing of breeding stock. This organization or company either markets directly or facilitates market access for its partners or contractors.

PEI Quality Swine Inc. is one such organization. Since it is the only minimal disease swine breeding company currently situated in Prince Edward Island, this profile is based on its regulations and protocol. PEI Quality Swine Inc. is owned by the hog producers of Prince Edward Island, through the Prince Edward Island Hog Commodity Marketing Board, to which it is accountable. There are seven Directors on the Board of PEI Quality Swine, comprised of two representatives from the PEI. Quality Swine Multiplier Breeders Association, four from the Hog Board, and one from the PEI. Swine Breeders Association (the purebred breeders).

PEI Quality Swine Inc. owns and operates a 130-sow nucleus breeding unit in Grandview, established in 1976, and a 220-sow nucleus unit plus an AI Centre, for the production of semen, in Ocean View, built in 1998. These two nucleus units form the top of the pyramid, supplying purebred seed stock (gilts, boars and semen) to the next level, the "multiplier breeders", who in turn produce either purebred or crossbred (F1) stock to sell to "commercial producers" locally and around the world. "Commercial producers" are primarily in the business of producing pork for food. However, if they do sell breeding stock, they are selling "third" generation genetics, called F_2's.

This profile will focus primarily on the production of F1 stock.

The current Quality Swine multiplier breeders and developing multiplier breeders possess about 4,700 sows with a potential output of 30,000 replacement offspring annually.

Production of Breeding Stock

There are two major differences between raising hogs for slaughter and raising breeding stock:
1) stringent health practices must be enforced and health status constantly monitored; and
2) breeding records must be maintained so that genetics and pedigrees can be tracked and evaluated.

Health Issues

The "PEI Quality Swine Regulations and Procedures Manual" provides complete and detailed protocol for every activity associated with raising minimal disease swine, from rodent control to feed delivery, from introduction of incoming breeding stock to site selection. It is **the** reference book for multiplier breeders with Quality Swine. Readers must ensure that they are using the most recent version.

Quality Swine herds are tested monthly by the consulting veterinarian. To maintain minimal disease status, a multiplier breeder herd must always test negative for:
1. Actinobacillus *pleuropneumoniae*
2. Mycoplasma hyopneumonia
3. Lice (Hematopinus Suis)
4. Mange (Sarcoptes scabi var. Suis)
5. Porcine Reproductive and Respiratory Syndrome Virus (PRRS)
6. Progressive Atrophic Rhinitis
7. TGE/PRVC
8. Serpulina *hyodysenteriae*

Genetic Tracking And Evaluation

The swine herd in Prince Edward Island is comprised primarily of four breeds: Yorkshire, Landrace, Hampshire and Duroc. The production of F1 breeding stock results from crossing two purebreds.

There are two aspects to genetic tracking:

1. Registration of purebred animals through the Canadian National Livestock Records system (F_1's are not registered), and maintaining pedigrees for both purebred and F1 stock.

At around three weeks of age, purebred and F_1 stock that show promise as breeding stock are selected and tattooed. Tattooing can be a time-consuming process. Then, for any purebred litters where potential breeding stock has been identified, the litter is registered as a unit. Registration costs $9.50 per litter (if litter is under one year of age) for a "paper less" registration (individual animal identification numbers are emailed or returned to the owner on a worksheet), or for $14.00 per litter (if litter is under one year of age) for a "paper" registration (a formal registration paper for the litter is issued). Registration papers for individual animals are issued later for $4.50 apiece, when the final decision to keep or sell the animal for breeding purposes is made. If the animal is sold, a further $6.00 is charged for transfer of the registration. Thus, for animals sold as purebred breeding stock, the total individual charge for registration is $10.50 ($4.50 + $6.00) per animal, in addition to the earlier per litter charge.

2. Genetic evaluation of both purebreds and F1=s through the Canadian Swine Improvement Program (CSIP) (formerly called the ROP program) for amount of back fat, age at 100 kilograms, and number of pigs born per litter.

The Prince Edward Island Department of Agriculture and Forestry does the on-farm genetic evaluation for Prince Edward Island swine breeders, as part of CSIP. On-farm testing is done every two to four weeks. Results of the data collected are used to generate Estimated Breeding Values (EBVs) for purebreds. EBVs are a comparison of genetics across all participating swine herds in Canada. Herd managers use these results to evaluate how their herds measure up against other herds and to select breeding stock. Results of F1 testing are compared within the participating herd, and are used by managers to select breeding stock for sale.

Using Artificial Insemination

Artificial insemination (AI) is now widely used in both commercial and breeder herds. While commercial producers make a management choice between natural breeding and AI, breeder herd managers who want to be competitive in the gilt market believe they must choose AI for access to superior genetics. Boar semen is available from the AI Centre in Ocean View in two types: Purebred and Pooled. Multiplier breeders would use purebred semen to produce F1 progeny.

Under the Animal Health and Protection Act (Province of Prince Edward Island), there are restrictions on semen importation. Boar semen being imported to PEI must come from Canadian Food Inspection Agency export-accredited AI Stations, which include Canadian AI Stations, such as Ontario Swine Improvement Unit, First Choice Genetics in Ontario, CIPQ (Quebec), and Alberta Swine Genetics. These four supply the off-Island studs most frequently used by PEI breeders. All imported semen must be tested for PRRS at the Atlantic Veterinary College, at the expense of the importer, prior to use.

The APHIN Program

The Animal Productivity and Health Information Network (APHIN) is a program of the Atlantic Veterinary College which summarizes swine health and production data for the Province. Health data on all hogs slaughtered at Garden Province Meats (GPM) in Charlottetown is electronically retrieved by APHIN, which

produces graphs and reports for individual commercial and breeding stock producers, to assist them in monitoring disease levels in their herds. APHIN also summarizes data from computerized production recording programs for individual swine herds, calculating averages that can serve as benchmarks for managers.

The APHIN program is an integral part of the health monitoring required for multiplier herds. It also gives continuous reports of the health status of the entire swine industry in Prince Edward Island, which is useful in planning both production and marketing strategies.

Working with the Veterinarian

Quality Swine has contracted with the Atlantic Veterinary College for consulting veterinarian services. These services include laboratory analysis and overall health monitoring of the swine breeding system, including monthly inspections of multiplier herds.

Codes of Practice

All swine producers are expected to follow the "Recommended code of practice for the care and handling of farm animals: Pigs." The code resulted from deliberations among many groups, including producers, practicing professionals, researchers, processors, and animal care and welfare organizations. Although it is voluntary, it provides an excellent guide to responsible animal care, and reflects the expectations of fellow farmers, practicing professionals, and society in general. It is an excellent reference by which to evaluate individual animal husbandry practices.

In 1996, in an effort to promote good stewardship among Canadian hog producers, the Canadian Pork Council published the "Canadian Code of Practice for Environmentally Sound Hog Production." It, too, is a voluntary code. It provides a standard by which to assess the environmental practices of individual producers, and is an important reference book.

Note: Both these Codes of Practice contain some elements which are not voluntary, but are legal requirements.

Depopulation/Repopulation

The decision to depopulate an existing swine facility in order to repopulate with minimal disease stock has major financial consequences for the business, and should be undertaken only after thorough consideration, analysis and planning. It is a process that requires the cooperation of many partners, including owners and workers, veterinarians and engineers, contractors and suppliers, business consultants and lenders. Detailed cash flow budgeting and close following of well-thought out time tables are crucial to the success of the undertaking.

There are two reasons for considering depopulation/repopulation:
1. for a commercial producer to significantly improve herd productivity (through the control of disease), or
2. to become a multiplier breeder of minimal disease stock "Depopulating and Repopulating a Swine Herd", published by Veterinary Infectious Disease Organization (VIDO), located in Saskatoon, Saskatchewan, and "Exploring Depopulation/Repopulation Issues on Nova Scotia Hog Farms" are "must reads" for any swine producers considering such a move. They contain some excellent work sheets to help establish various time tables and budgets.

"PEI Quality Swine Regulations and Procedures Manual" describes in detail the requirements for establishing a new breeding herd, including the process of depopulation/repopulation. These procedures must be fully understood and strictly followed. The applicant must work closely with the consulting veterinarian and the Board of Quality Swine throughout the depopulation/repopulation process.

Depopulation and final clean-up should be timed to coincide with the mid-June to mid-August period, when outside temperatures are highest. The manual lists four stages for cleanup:
1. Initial Clean-up, as depopulation occurs and immediately following depopulation
2. Remodeling of facilities
3. Final Clean-up, at which time a strict biosecurity program must be implemented
4. Down-time of a minimum of thirty days, followed by fumigation

The challenge in depopulation/repopulation is to return to full production as quickly as possible, while complying with all regulations and down times. The use of Aoff-site@ facilities to finish "depopulated" pigs, and to quarantine incoming gilts can alleviate some of the cash flow pressures. Prior arrangements with Quality Swine to ensure a timely supply of gilts is required.

Marketing of Breeding Stock

The Market

There is an off-shore market, although limited, for purebred gilts and boars from Prince Edward Island. Our market for F1's and F_2's is primarily restricted to North America, including Mexico, because transportation costs are usually prohibitive outside North America. There is a small local market for F_1's, as replacement stock for commercial herds and for repopulation of depopulated herds; and for purebreds, to introduce different genetics to fellow multiplier breeders.

PEI Quality Swine Inc. is becoming more active in identifying and pursuing international marketing opportunities, thus facilitating individual access to these markets. However, PEI Quality Swine Inc. does **not** market breeding stock on behalf of its multiplier breeders. It is the responsibility of each individual multiplier breeder to understand the market place, to identify where his/her individual business fits in this market place, and to find a market for stock produced. Alignment with a larger organization and/or fellow multiplier breeders can greatly assist the producer to market his/her minimal disease breeding stock.

To evaluate some of the marketing activities of PEI Quality Swine Inc., prospective multiplier breeders can visit its web site, watch its international marketing video, visit its trade show booth, or read about its trade mission and buyer hosting activities.

All multiplier breeders are members of the PEI Quality Swine Multiplier Breeders Association. Through their two representatives on the Board of PEI Quality Swine Inc., they can have input into the pursuits and priorities of Quality Swine. In other words, multiplier breeders have the opportunity to help shape the direction of their breeding company.

The Canadian Pork Council's CQA™ Program

During the period late 1995 to 1997, the Canadian Pork Council developed a Canada-wide program to provide written assurances of quality to buyers of Canadian pork. The Canadian Quality Assurance (CQA™) Program is based on the internationally recognized approach to food safety, known as Hazard Analysis Critical Control Points (HACCP). This program is required for all food processors exporting to the US, but is not yet in use on many farms. The CQA™ Program is expected to be launched by the Hog Board in Prince Edward Island in the near future. The general health status of Prince Edward Island swine results in reduced usage of medications. Some producers would like to use CQA™ to access an international market for low drug residue pork.

There are two major implications of CQA™ for multiplier breeders:

1. Because of the health status of their herds, multiplier breeders use, on average, even fewer drugs than commercial producers. Moreover, they are already doing some of the on-farm monitoring and documentation required by the CQA™ Program. Therefore, multiplier breeders are a logical first group to be accredited with CQA™ status. They are thus positioned to reap the benefits of any market advantage from CQA™ for the pork they sell as meat.

2. As CQA™ becomes more widely used in Prince Edward Island and across Canada, there will be more interest among commercial producers to depopulate/repopulate. This is expected to result in increased demand (i.e. a growing market) for minimal disease breeding stock.

For complete details, see the "Canadian Quality Assurance Program: Producer Manual."

Competition

Swine from the PEI Quality Swine Inc. system are competitive internationally because of their superior health status. Specifically, Quality Swine animals are PRRS-negative. PEI genetics are also high quality, which, combined with high health status, has created demand for breeding stock from Prince Edward Island.

Competition in the swine breeding stock market is fierce. Unlike the poultry industry, where very few companies supply breeding stock, several large companies specialize in swine genetics, such as Pig Improvement Corporation (PIC) in Ontario, GenetiPorc in Quebec, and Genex (NPD) in Saskatchewan. These companies and others like them are Quality Swine's competitors.

The first level of competition for an individual multiplier breeder is from fellow multiplier breeders in the Quality Swine system. While health status may be equal, there will be differences in genetics and conformation among multiplier herds. The second level of competition is from other individual farms in eastern Canada with the same health and genetic claims as Quality Swine. The third level of competition is from fellow participants in the Canadian Swine Improvement Program. Breeding stock companies not involved with the Canadian Swine Improvement Program also provide major competition.

Pricing

The price for PEI Quality Swine F1=s sold to Prince Edward Island hog producers is established by formula. The current selling price for an F1 gilt weighing 106 kilograms is: the per hundred kilogram (ckg) market price for a 100-index hog plus $100, with a per kilogram charge for overweight.

Export prices vary widely. There are additional costs associated with exporting stock, such as advertising, blood testing, quarantine, and commissions, which must be accounted for in any transactions with exporters.

Human Resource Requirements

Skills

In addition to the many skills required to manage and work in a commercial farrow to finish operation, there are a number of specialized skills essential to the success of the swine breeding stock enterprise.

The prospective multiplier breeder must:
1. understand swine genetics
2. understand the biology of swine diseases
3. have an eye for good conformation
4. know what to select for in breeding stock, according to market demand

5. be able to successfully artificially inseminate sows
6. have the desire to follow all rules and regulations for raising minimal disease swine
7. have the commitment and the ability to strictly enforce all biosecurity measures
8. tattoo nursing pigs
9. promptly register purebred swine (if selling purebreds)
10. participate in a swine productivity program, such as PigCHAMP
11. participate in the Canadian Swine Improvement Program for genetic evaluation
12. fully participate and be flexible in marketing activities
13. develop good relationships with buyers
14. be comfortable with the uncertainties of the market place
15. be able to accept the many production and marketing risks
16. do the necessary record keeping required for genetic monitoring and evaluation, and disease monitoring
17. be able to service customers and be available for queries

To assess your current abilities, acquire more skills, gain appreciation for what is involved in managing a swine breeding herd, and test your enthusiasm for such a venture, you should consider volunteering at an existing multiplier breeder operation for a period of time, minimum two weeks, preferably longer.
The standard management skills necessary in all small businesses are needed by the manager of a swine breeding facility.

Labour Requirements And Salaries

A rule of thumb often quoted for a commercial farrow to finish operation is 100-125 sows per worker. It has been suggested that an additional one half person year per 100 sows is required to do the extra record keeping, tattooing, marketing-promotion, extra moving of pigs, extra cleaning, health monitoring, and overall management required for selling breeding stock. Thus for 240 sows, at least three full-time persons would be required - one could be the overall manager (salary might be $35,000 to $45,000 per year), one a herd manager (salary might be $25,000 to $35,000 per year), and one a herd worker (salary might be $20,000 to $30,000 per year).

In addition to the salaries, labour costs include the employer's contributions to Canada Pension Plan (CPP) and Employment Insurance (EI). Participation in the Worker Compensation Plan (WCP) is optional for workers involved in primary production. However, farm employers should consider WCP coverage.

Risk

Risk is always a major consideration in any business undertaking, including all types of farming.

In addition to the financial exposure with the large investment required and the production risks inherent in any swine operation, there are some specific risks for the producer of minimal disease breeding stock.

One of the great risks is the loss of minimal disease status, and the immediate halt to selling animals for breeding purposes. Any breach of biosecurity poses a risk. There is no affordable insurance to mediate such risks.

Trade issues and currency exchange rates are major risk concerns if exporting.

Since F_1's are sold primarily in North America, trade relations with the United States and Mexico affect access to these markets. Currency exchange rates affect the returns received, and thus the potential profitability of the transaction.

Ways to alleviate these currency issues are forward contracting, hedging, and other methods described elsewhere.

North American market prices for breeding stock fluctuate widely. This unpredictability is a major risk factor. In projecting potential returns, producers are advised to make financial decisions based on local formula prices.

Environment

All swine operations must consider the environmental implications of their activities. Keeping water courses and ground water clean, and keeping air quality high are the primary objectives of a sound environmental plan, which benefits farmers and non-farmers alike. Raising breeding stock is no different from other types of swine production. Manure management, proper disposal of mortalities, and odour control are the major environmental concerns of most swine operations.

Compliance with the 1999 amendments to the Prince Edward Island Environmental Protection Act, known as Bill 14, requires control of manure runoff, and maintenance of buffer zones.

When expansion or changes in direction for a farm are being planned, it is an opportune time to complete an Environmental Farm Plan (EFP), and to identify priority action items. Environmental upgrades can then be budgeted for in the overall business plan. Workshops on Environmental Farm Plans are conducted regularly. Contact the Prince Edward Department of Agriculture and Forestry for details.
If new facilities are being constructed, there are a number of "minimum distance" requirements to meet - such as those in Bill 14, with regards to watercourses, and in the Planning Act, with regards to neighboring residences, other non-agricultural facilities and property lines. These are called Minimum Separation Distances (MSD).

The "Guidelines for Manure Management for Prince Edward Island", published in 1999 following extensive consultation with farmers and the general public, describes recommended manure management systems and acceptable practices which will reduce the risk of pollution and minimize odours. It is an excellent reference, a thorough compilation of both existing regulations and recommended practices. An Environmental Review Document is required to be submitted for approval to the Prince Edward Island Department of Technology and Environment for new or expanded operations with more than 160 sows farrow to wean or more than 50 sows farrow to finish. This is part of the Environmental Impact Assessment (EIA) Process.

Development Costs

Development costs for a swine enterprise include land, site development (such as: constructing access roads, landscaping, digging wells), manure storage, buildings, equipment and licenses/permits.

High initial capital investment can be a major barrier to entry into swine production.
Development/Building Permits

Prior to any site purchase, construction or renovations, farmers must obtain a development/building permit from the Prince Edward Island Department of Community Affairs and Attorney General. Application forms are available from that Department or at Access-PEI Offices across the Province. An Environmental Review Document will also be required at the same time. These documents are submitted to the Department of Technology and Environment for the completion of the Environmental Impact Assessment. Approval for the project comes from that Department, prior to a building permit being issued. The application fee for a building permit for a building having a floor area of not more than 32,298.8 square feet (3,000 square metres) is $130; for an "accessory building," including a manure storage, having a floor area greater than 1,076.4 square feet (100 square metres) is $80.

New Facilities

THE SITE: Selecting a site for construction of any type of swine building is an involved process, requiring

building permits, adherence to minimum separation distances (MSD), as outlined in the Planning Act and Bill 14, and an Environmental Review for operations of more than 160 sows farrow to wean, or 50 sows farrow to finish.

When choosing a site for raising minimal disease swine, keep in mind the additional recommendation that stock be raised in buildings located at least five kilometres from any other hog barns; and that it would be advantageous for such units to be located at least five kilometres from creeks, rivers, main roads, abattoirs, stockyards, and hog assembly yards. Being able to control access to the site is essential. How the site lends itself to restricting the entry of both people and vermin is a most important consideration. Setting the buildings far back from the highway may be useful in some situations. Blending the site into its surroundings may be advantageous. Properly located wind breaks can be used to enhance both biosecurity and environmental quality.

The cost of purchasing and/or developing such a site will vary greatly, and therefore is not included in these cost estimates.

LAND: The "Guidelines for Manure Management for Prince Edward Island" provides a worksheet and reference tables for calculating the minimum land base required for manure application. An example worksheet for 240 sows, farrow to finish, is shown in **Table 1**, and indicates that a minimum of 280 hectares (some 700 acres) are required for manure application to a crop of barley. If the manure is used for corn, wheat, or potatoes, fewer acres are required.

Table 1: Estimating Land Base Required for Manure Application

STEP 1:	Number of livestock	240 sows
STEP 2:	Annual Nitrogen per Animal	91 kg
STEP 3:	Nitrogen Retention Rate, concrete storage	0.64
STEP 4:	Nitrogen Utilization for Barley	50 kg/ha
STEP 5:	Hectares required (Multiply Step 1, 2, and 3, then divide by Step 4)	280 ha
	Converted to Acres	692 acres

Land values and prices will depend on location and circumstances. The swine producer might own all or only a portion of the required land base. If insufficient land is owned to effectively utilize the manure, then written spreading agreements with other land owners for land application of manure for the purpose of growing crops are recommended ("Guidelines for Manure Management"). Such agreements are required as part of the building permit process.

If land must be purchased, its capital cost could range from $2,500 to $10,000 per hectare. Because there are many possible scenarios, land costs are not included in these cost estimates.

Buildings and Equipment: A rule of thumb to estimate the cost of buildings and installed equipment is: $3,500 to $5,000 per sow for new buildings and equipment for a farrow to finish operation. Thus, for 240 sows, the initial investment could be $840,000 to $1,200,000. Of course, each individual situation is different. Any one considering establishing a swine operation must prepare specific estimates for the particular design and systems chosen, from quotes obtained from contractors and suppliers.

Manure Storage: Liquid manure is the most common means of handling swine manure in Prince Edward Island. The building permit process requires that a professional engineer be hired and paid by the applicant to approve the site, design the storage, monitor the construction of it, and certify to the Department of Technology and Environment that it has been properly constructed. The liquid manure

storage facility should be sized to contain a minimum of seven months (210 days) of manure production and accumulated precipitation ("Guidelines for Manure Management"). Depending on a number of management factors, a circular concrete manure storage tank, 120 feet in diameter and 14 feet deep, may be adequate for 240 sows, farrow to finish, assuming that one-quarter of the required storage is "in-barn". The cost of this example manure storage is estimated to be $85,000 - $90,000, plus the engineering fees. It is recommended that a cover for the manure storage be considered to a) increase the capacity of the storage by eliminating precipitation from entering the storage and b) reduce odours. The cost of a cover for a manure storage is approximately $15,000.

Additional Development Costs for Multiplier Breeders: Establishing a multiplier breeder facility involves all of the costs described above **and** additional investment, for such necessities as:

- shower facilities and change area
- quarantine facilities: a separate building through which to introduce incoming breeding stock. For a 240-sow enterprise, this could be a modestly-equipped small building, possibly twenty feet by thirty feet, which would house up to thirty gilts and/or boars at a time, at an estimated cost of $25 per square foot, for a total cost of perhaps $15,000
- extra space to raise and hold breeding gilts to an average marketable weight of 123 kilograms, an additional eighteen kilograms over the average 105-kilogram slaughter weight, requiring, on average, an extra four weeks of pen space
- construction of barriers to restrict access to the property

Other additional investment is optional, but could include:

- extra space in the form of sales pens to assemble an order
- viewing window for prospective buyers
- space to hold bred gilts, for an extra thirty to ninety days (average sixty days), if bred gilts are part of the marketing plan

Renovated Facilities

Any one approved for depopulation/repopulation must have their building changes approved by the consulting veterinarian. Extensive renovations will likely be required. Existing nonswine buildings may also be renovated. It is impossible to include renovations in the cost estimates for this profile. Contractors who are experienced in doing swine barn renovations should be asked to prepare cost estimates for the specific changes required.

Breeding Stock

Timing the arrival of breeding stock with the completion of construction has major implications for cash flow. All breeding stock must be sourced from PEI Quality Swine. There is a formula price for the purebred gilts which multiplier breeders must buy. The current formula for a gilt weighing 106 kilograms is: the per hundred kilogram (ckg) market price for a 100-index hog plus $200, with a per kilogram charge for overweight. Arrangements must be made with the Quality Swine nucleus herd for timing the purchase of purebred gilts. Breedings must be done over a four to five month period, to match the breeding cycle designed into the buildings.

Potential Returns and Expenses

There is little recent data available on swine returns and expenses in Prince Edward Island, and none for breeding stock enterprises.

The sample budgets presented here were compiled from extensive conversations with producers and extension workers.

In addition, the Ontario Ministry of Agriculture, Food and Rural Affairs' Swine Enterprise Budget and the

Nova Scotia Farm Management Analysis Project on Swine were used for background information.

For the purposes of this profile, a herd size of 240 sows farrow to finish was selected, because it was considered to be well suited to a family operation, consisting of two to three related owners. Example direct returns and expenses for both a commercial and a multiplier breeder operation were calculated (see **Table 2**). You will notice that there is less than $6,000 increase in contribution margin for the multiplier breeder unit, which would be insufficient to cover the increased interest and other indirect (overhead) costs associated with the multiplier operation. It is important to note that returns in this budget are calculated on selling 25% of production for breeding, all to the local market.

There is a potential for greater returns if more than 25% are sold for breeding and/or the export market can be profitably accessed.

For a comparison of contribution margins with various selling assumptions, see **Table 4.**

TABLE 2: 240-Sow Farrow to Finish Operation

For use in planning, and in calculating your own cost of production

ASSUMPTIONS:

SIZE OF OPERATION	240 sows, "farrow to finish"
PRICES	Hog price is the quarterly average of the last ten years (ending with the first quarter 1999) =$1.52/kg
	Price of breeding gilts is the "local" (not export) price (= hog market price + $100)
	Cull Sow Formula Price = 65% X price of 100-index hog
	Cull Boar Price = $0.20 per kg live weight
	Swine Quality Improvement Program @ $4 per hog, 90% hogs are eligible
SELLING WEIGHTS	Hogs: Live Weight = 106 kg, dressing 80%, dressed weight = 85 kg, Index = 108
	Gilts: Live Weight = 122 kg
	Cull Sows: Dressed Weight = 155 kg
	Cull Boars: Live Weight = 205 kg
SALES	Breeding: 75% of pigs produced sold for slaughter, 25% sold for breeding stock
PRODUCTIVITY	Commercial: 21 hogs sold per sow per year
	Breeding: Reduced productivity because purebreds: 19.7 raised per sow per year; 19.5 sold per sow per year - rest kept for replacements
	2.2 litters per sow per year
DEATH LOSSES	Pre-Weaning Death Loss- 10%, = 11.2 (10.5) born per litter, 10.1 (9.5) weaned per litter
(breeding #'s in brackets)	Post-Weaning Death Loss (up to 22 kg) - 2% = 9.9 (9.3) go to feeder barn per litter
	Grower-Finisher Death Loss - 3% = 9.6 (9.0) finished per litter
	Sows - 3%, = 7 mortalities per year
REPLACEMENT RATE	Commercial: Sows - 35% - all purchased
	Breeding: Sows - minimum 25% purchased; remaining 15% kept .Total replacement rate = 40%
	Boars (required for heat detection) - 25% - all retained
COST OF REPLACEMENTS	Commercial: Formula Price (the per hundred kilogram market price for a 100-index hog plus $100)
	Breeding: Formula Price (the per hundred kilogram market price for a 100-index hog plus $200)
LABOUR	Commercial: 2 persons required @ $40,000 and $25,000
	Breeding: 3 persons required @ $40,000, $30,000, and $25,000
	Additional 10% allowed for employer costs
SEMEN	Commercial: $8.00 per tube, 2 tubes per breeding, 2.2 breedings per year
	Breeding: $20 to $30 per tube, average $25, 2 tubes per breeding, 2.2 breedings per year
TRUCKING	Commercial: $2.50 per slaughter hog
	Breeding: $3.40 per slaughter hog, due to increased biosecurity measures
PRODUCTIVITY PROG.	Cost is $0.25 per sow per month
BIOSECURITY	Biosecurity and barn supplies include a ready supply of clean coveralls, boots, socks, masks towels, shower soap, shampoo, and laundry detergent
VET AND SANITATION	Vet and sanitation includes drugs and animal and pen sanitation
MINIMAL DISEASE TESTING	Minimal Disease Serology Testing Program cost is $625 per month
CSIP	Costs are annual fee of $250 plus $16 per litter, assume 10% of litters tested
REGISTRATION	Assume 10% of litters produced are registered @ $9.50 per litter paper less method
	Assume 40 animals are individually registered for replacements @ $4.50
MEMBERSHIP FEE	Canadian Swine Breeders' Association membership fee is $150 annually
OFFICE	Additional computer usage and office supplies are required, but not included here
ADVERTISING &	These are costs associated with exporting, so are omitted from this budget

Table 2 continued...

	COMMERCIAL		BREEDING	
INCOME	Total $	$/Head Sold	Total $	$/Head Sold
Sale of Market Hogs	703,261	139.54	489,771	104.65
Swine Quality Improvement Program	18,144	3.60	12,636	2.70
Sale of Breeding Stock			294,840	63.00
Sale of Cull Sows	11,761	2.33	13,599	2.91
Sale of Cull Boars	82	0.02	82	0.02
TOTAL INCOME	733,249	145.49	810,928	173.28
DIRECT EXPENSES				
Feed	423,111	83.95	401,007	85.69
Feed for breeding gilts			29,256	6.25
Purchase of Replacement Gilts	21,168	4.20	21,120	4.51
Vet & Medicine & Sanitation	7,560	1.50	11,700	2.50
Minimal Disease Testing			7,500	1.60
Semen	8,448	1.68	26,400	5.64
CSIP			1,095	0.23
Membership: Can Swine Brders			150	0.03
Registration Fees			682	0.15
Trucking - Slaughter Hogs	12,600	2.50	11,934	2.55
Marketing Fees for Slaughter Hogs	10,937	2.17	7,617	1.63
Electricity	18,000	3.57	18,000	3.85
Biosecurity and Barn Supplies	4,320	0.86	8,640	1.85
Labour	71,500	14.19	104,500	22.33
Productivity Program	720	0.14	720	0.15
TOTAL DIRECT EXPENSES	578,364	114.75	650,320	138.96
CONTRIBUTION MARGIN	154,885	30.73	160,608	34.32

PLEASE NOTE: These are example costs only. This budget is provided as a guide. Prospective swine farmers must develop their own set of figures for business planning purposes.

The **Contribution Margin** must provide funds for interest, overhead costs, and other indirect expenses, living expenses, repayment of loans, and future investment in the business. To demonstrate the effect of size in the comparison of the commercial and multiplier breeder operations, a budget based on 500 sows is also included, as **Table 3**. Returns in this budget are also calculated on selling 25% of production for breeding, all to the local market. The $40,000 advantage in contribution margin should be adequate to cover the increased interest and indirect expenses of the multiplier breeder operation.

TABLE 3 500-Sow Farrow to Finish Operation

For use in planning, and in calculating your own cost of production

ASSUMPTIONS ARE THE SAME AS TABLE 2'S, EXCEPT FOR THESE:

SIZE OF OPERATION 500 sows, "farrow to finish"
LABOUR Commercial: 4 persons required @ $40,000, 35,000, $30,000 and $25,000
Breeding: 5 persons required @ $45,000, $40,000, $35,000, $30,000, and $25,000
Additional 10% allowed for employer costs

	COMMERCIAL		BREEDING	
INCOME	Total $	$/Head Sold	Total $	$/Head Sold
Sale of Market Hogs	1,465,128	139.54	1,020,357	104.65
Swine Quality Improvement Program	37,800	3.60	26,325	2.70
Sale of Breeding Stock			614,250	63.00
Sale of Cull Sows	24,502	2.33	28,331	2.91
Sale of Cull Boars	174	0.02	174	0.02
TOTAL INCOME	1,527,605	145.49	1,689,437	173.28
DIRECT EXPENSES				
Feed	881,481	83.95	835,432	85.69
Feed for breeding gilts 60,949 6.25				
Purchase of Replacement Gilts 44,100 4.20 44,000 4.51				
Vet & Medicine & Sanitation 15,750 1.50 24,375 2.50				
Minimal Disease Testing 7,500 0.77				
Semen 17,600 1.68 55,000 5.64				
CSIP 2,010 0.21				
Membership: Can Swine Breeders' Assoc 150 0.02				
Registration Fees 1,225 0.13				
Trucking - Slaughter Hogs 26,250 2.50 24,863 2.55				
Marketing Fees for Slaughter Hogs 22,785 2.17 15,868 1.63				
Electricity 37,500 3.57 37,500 3.85				
Biosecurity and Barn Supplies 9,000 0.86 18,000 1.85				
Labour 143,000 13.62 192,500 19.74				
PigCHAMP or Equivalent 1,500 0.14 1,500 0.15				
TOTAL DIRECT EXPENSES 1,198,966 114.19 1,320,872 135.47				
CONTRIBUTION MARGIN 328,639 31.30 368,565 37.80				

PLEASE NOTE: These are example costs only. This budget is provided as a guide. Prospective swine farmers must develop their own set of figures for business planning purposes.

The **Contribution Margin** must provide funds for interest, overhead costs, and other indirect expenses, living expenses, repayment of loans, and future investment in the business.

Table 4: Contribution Margins: Various Assumptions

	CONTRIBUTION MARGIN
240 SOWS, FARROW TO FINISH	**$**
Commercial	154,885
Selling 25% Breeding Stock @ Local Price = $252	160,608
Selling 35% Breeding Stock @ Local Price = $252	204,146
Selling 25% Breeding Stock @ Net Export Price = $400*	333,768
500 SOWS, FARROW TO FINISH	
Commercial	328,639
Selling 25% Breeding Stock @ Local Price = $252	368,565
Selling 35% Breeding Stock @ Local Price = $252	459,269
Selling 25% Breeding Stock @ Net Export Price = $400*	729,315
750 SOWS, FARROW TO FINISH	
Commercial	509,453
Selling 25% Breeding Stock @ Local Price = $252	532,133
Selling 35% Breeding Stock @- Local Price = $252	668,188
Selling 25% Breeding Stock @ Net Export Price = $400*	1,073,258
1000 SOWS, FARROW TO FINISH	
Commercial 673,767	
Selling 25% Breeding Stock @ Local Price = $252	684,700
Selling 35% Breeding Stock @ Local Price = $252	855,246
Selling 25% Breeding Stock @ Net Export Price = $400*	1,406,200

*Price received is net of advertising, commissions, inspections, testing, and other selling costs

Development Potential

PEI Quality Swine Inc., through its existing pyramid system, can produce enough purebred gilts to supply an almost unlimited number of multiplier breeders. These purebreds can come from either the two nucleus herds or a multiplier herd. It is the size of the market that will determine how many multiplier breeder operations can thrive in the Province. Since this is a developing market, it is difficult to predict its potential.

To be effective in the export market, Quality Swine must be able to assemble larger numbers of gilts per shipment than it currently can. In other words, at this point, it is not known just how great the demand for Quality Swine gilts could be.

PEI Quality Swine Inc. believes that the greatest opportunity for the entire swine industry in the Province is to mount a collective effort to research and develop a specialty market for premium, certified meat products. The driving force for this effort is consumer demand for low-residue foodstuffs. If these efforts are successful, the market for minimal disease breeding stock could grow significantly.

PEI Quality Swine Inc. believes that the optimum herd size for a farrow to finish operation is in the 500 to1000 sow range. For multi-site farrowing only, it believes that herd size should be in the 1000 to 2000 sow range.

Quality Swine recognizes that each situation is unique. A 240-sow operation could be profitable with superior management and an effective marketing plan. Smaller operations can be an excellent entry point to the breeding enterprise. A growth strategy should be considered in the long-range plans of smaller operations.

Regulatory Issues

Swine producers must be aware and knowledgeable about a number of Acts which govern many of the activities with which they may be involved.

Animal Health and Protection Act (Province of Prince Edward Island) -Animal Welfare Section - This section of the Act sets standards for the proper care of animals, including housing and feeding.

Animal Health and Protection Act (Province of Prince Edward Island) - Swine Importation Regulations - Importation of swine into Prince Edward Island is restricted. Health testing is required for all swine, including boar semen, being imported to farms. Imported swine must be certified as testing free of all named diseases.

PEI Quality Swine Regulations and Procedures - This manual specifies detailed regulations and procedures for all operations and circumstances of the multiplier breeder business. Producers should ensure that they have the latest version of this manual.

Prince Edward Island Hog Commodity Marketing Board Regulations - Under the Natural Products Marketing Act, the Hog Board functions with several "Orders", enabling it to act on behalf of producers in the conduct of various activities. One of its regulations requires that all swine producers be licensed.

Canadian National Livestock Records - Regulations and procedures for tattooing and registering swine are issued from this body.

Canadian Code of Practice for Environmentally Sound Hog Production - This is a compilation of regulations and recommendations promoting good stewardship and environmentally-sound farm practices.

Recommended code of practice for the care of farm animals: Pigs - This is a compilation of regulations and recommendations for responsible animal care and acceptable swine husbandry practices.

Guidelines for Manure Management for Prince Edward Island - This is a compilation of regulations and recommendations for manure handling, including storage and utilization practices.

Environmental Protection Act - New swine operations and expansions to existing swine operations require approval under the Environmental Protection Act. There is no application fee. The Act was further amended in 1999 requiring livestock operations to control manure runoff and maintain buffer zones.

The Planning Act - Development/Building permits must be obtained for new livestock facilities, expansions or modification of existing operations, change of use of livestock buildings, and construction of manure storage facilities. Fees vary.

Roads Act - Highway Access Regulations - Anyone who intends to install a new highway access, or change an existing access, requires an Entrance Way Permit under these Regulations. There is an application fee. If a highway access culvert is required, or needs to be relocated, there is a fee.

Occupational Health and Safety Act - At the present time, farming operations which are located on property that qualifies for a farm assessment under the Real Property Assessment Act are **not** subject to the requirements of the Occupational Health and Safety Act and Regulations. However, the Act and Regulations can provide excellent guidance on worker health and safety issues, and assist farmers to be more competitive in the labour market.

Pesticides Control Act - Anyone wishing to purchase and/or apply any pesticides, with the exception of domestically-labeled products, must be certified under this Act.

Canada Food and Drug Act - Anyone selling meat should be concerned with this Federal Act with respect to antibiotic residues and food additives.

Regulations in Importing Countries or Provinces - Each importing jurisdiction may have health and quarantine regulations which require compliance in order to complete a sale. Meeting the specifications is the responsibility of the seller, and must be factored into the price charged. Swine exporters must be knowledgeable about the particular requirements of each market.

Key Management Issues

In summary, if you wish to continue to investigate swine breeding stock production, here are some of the key issues to consider before proceeding:

1. You must be accepted into the PEI Quality Swine Inc. system. This is a pre-requisite to any further planning.
2. You must be willing to abide by the protocol and standards set by Quality Swine for multiplier breeders.
3. You must be prepared to learn all you can about swine breeding stock production and marketing.
4. You must develop a complete and thorough business plan for the swine breeding stock enterprise.
5. You must be able to assemble the significant amount of capital required to establish such an operation. This is a major challenge for most entrepreneurs.
6. You must have the ability and the desire to pay close attention to detail and enforce/maintain strict biosecurity measures at all times and for all persons, doing whatever is necessary to avoid the loss of health status.
7. You must be willing and able to take an active role in the process of marketing, by staying in constant touch with the marketplace, being flexible, and having patience to interact with it and to respond to its ever - changing demands.
8. You must be able to accept all risks associated with the enterprise.

Resources

Prince Edward Island Department of Agriculture and Forestry:

- Services in production, marketing and business management, testing for swine Improvement and feed testing services
  Agriculture Information Services
  Charlottetown Research Centre
  440 University Avenue
  P. O. Box 1600,
  Charlottetown, PEI C1A 7N3
  902-368-5663 Toll Free: 1-866-734-3276

  O'Leary District Agriculture Office 859-8841

  Summerside District Agriculture Office 888-8040

  Montague District Agriculture Office 838-0604

  Souris District Agriculture Office 687-7040

  Soil and Feed Laboratory

Charlottetown Research Centre
440 University Avenue
P. O. Box 1600,
Charlottetown, PEI C1A 7N3
902-368-5627

PEI Quality Swine Inc.

PEI Quality Swine Multiplier Breeders' Association

PEI Swine Breeders' Association

PEI Hog Commodity Marketing Board
Farm Centre
420 University Avenue
Charlottetown, PEI C1A 7Z5
902-892-4201 Fax 902-892-4203

Atlantic Veterinary College at the University of Prince Edward Island
550 University Avenue
Charlottetown, PEI C1A 4P3
902-566-0882

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Publications

1. PEI Quality Swine. Regulations and Procedures Manual, 4th Edition. Charlottetown, Prince Edward Island: PEI Quality Swine Inc., July 30, 1996.
2. Veterinary Infectious Disease Organization. Depopulating and Repopulating a Swine Herd. Saskatoon, Saskatchewan: Veterinary Infectious Disease Organization, August, 1994.
3. Nova Scotia Agriculture and Marketing. Farm Business Management & Economics Section. Exploring Depopulation/Repopulation Issues on Nova Scotia Hog Farms. Kentville, Nova Scotia: Farm Business Management & Economics Section, August, 1996.
4. Canadian Pork Council. Canadian Quality Assurance Program: Producer Manual. Canadian Pork Council, 1998.
5. Prince Edward Island Department of Agriculture and Forestry and Prince Edward Island Department of Technology and Environment. Guidelines for Manure Management for Prince Edward Island. Charlottetown, Prince Edward Island: January 7,1999
6. Prince Edward Island Department of Agriculture and Forestry. P. E. I. Swine Contacts. Charlottetown, Prince Edward Island: 1999
7. Canadian Farm Business Management Council. CFBMC Export Marketing Skills: Analysis and Case Studies.
8. Agriculture and Agri-Food Canada. Recommended code of practice for the care and handling of farm animals: Pigs. Ottawa, Ontario: Minister of Supply and Services Canada, 1993.
9. Canadian Pork Council. Canadian Code of Practice for Environmentally Sound Hog Production. Ottawa, Ontario: Canadian Pork Council, 1996.
10. Canadian Farm Business Management Council. Effective Farm Business Management Practices and Performance Measures.
11. Nova Scotia Department of Agriculture and Marketing, Business Management and Economics Section. Farm Management Analysis Project Farrow to Finish: 1997.

Web Sites

1. Prince Edward Island Department of Agriculture and Forestry: http://www.gov.pe.ca/af/agweb/
2. PEI Hog Commodity Marketing Board: http://www.peipork.pe.ca/
3. PEI Quality Swine: http://www.peipork.pe.ca/quality/index.htm
4. Ontario Ministry of Agriculture, Food and Rural Affairs. Pork News & Views
http://www.gov.on.ca/OMAFRA/english/livestock/swine/news.html

Acts

Copies of the Provincial Acts and Regulations referred to here can be purchased from: Island Information Service, Jones Building, 11 Kent Street, P. O. Box 2000, Charlottetown Prince Edward Island C1A 7N8. Phone 368-4000 or 368-5050, no charge 1-800-236-5196. Price varies according to number of pages (ranging from $1 to $20).

These Acts and Regulations can be viewed at most Libraries and at Access PEI sites - the Acts are bound with orange covers, and the Regulations are bound with green covers.

Copies of the Federal Acts referred to here can be ordered through the "Bookmark", book store at the Confederation Court Mall, Charlottetown, or viewed at the Government Services Library located in the basement of the Jones Building, 11 Kent Street, Charlottetown.